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Order and Stability in the Heavens:

A REPLY

TO

"THE LIFE AND DEATH OF WORLDS."

TWO LECTURES DELIVERED BY RICHARD A. PROCTOR,
F.R.A.S., AT THE ROYAL DUBLIN SOCIETY,
FEBRUARY 28TH, 1878.

BY THE

6

REV. J. CRAMPTON, M.A.,

AUTHOR OF "THE THREE HEAVENS," &c., &c.

"Lift up your eyes on high, and behold who hath created these things, that bringeth out their host by number: he calleth them all by names by the greatness of his might, for that he is strong in power; *not one faileth.*"—ISAIAH xl. 26.

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Order and Stability in the Heavens,

ETC.

"All this dread order break—for whom? for thee?"—*Pope*.

CHAPTER I.

MR. RICHARD A. PROCTOR has recently delivered two lectures at the Royal Dublin Society, with his usual ability and clearness, upon the subject of "The Life and Death of Worlds." The reputation of the lecturer as an astronomer and writer, as well as a mathematician, naturally attracted an intelligent and numerous audience. How far so speculative a subject as is implied in the title of the lecture was appreciated by many of those who had the privilege of hearing him, or was successful in bringing his audience generally to an agreement with his doctrines, I know not—but for myself I may say that not being fortunate enough to hear the lecture, but having studied the report carefully, and being thoroughly acquainted previously with Mr. Proctor's views and the school of thought to which he belongs, I regret that to many of the theories contained in this lecture I am compelled to dissent.

In the first part of the subject, relating to the birth or formation and growth of worlds, including our own globe (which furnishes a key to that of others) it will not be necessary to refer further than to say that to the doctrine of their gradual

development from a gaseous or a fluid state to a solid globe there does not appear to be any objection. This theory, indeed, being all but demonstrated by Sir Isaac Newton, has been universally received ever since—Geology as well as Astronomy bearing their testimony to its probability, while the Scriptures are silent upon the subject. To go beyond this, however, and with another lecturer of the same school,* to say, that the entire globe we inhabit was formed by the influx or aggregation of meteoric stones, and with Mr. Proctor, that the magnitude of our globe was, and is still being, increased by the fall of meteors upon its surface at the rate of 400 millions a year—each meteor weighing but ten grains, and consequently requiring four millions of years to add to the earth's surface a thickness equal to that of a sheet of paper. Such theories are, in my opinion, worse than useless, and seem vain attempts to penetrate a mystery which has not been and never can be made known to us, being evidently one of those "secret things that belong to the Lord our God." Without affirming, therefore, or denying the accuracy of this ingenious theory, which may be termed a mathematical or numerical amusement rather than a grave truth, I cannot but be reminded of the words of the Creator Himself to "One of old"—words which may fairly be applied to all such speculators of the *precise mode* of creation, "Where wast thou when I formed the foundations of the earth?"—Job xxxviii. 4. There is nothing easier or, perhaps, a more pleasurable occupation for a mathematician than having first formed an hypothesis to reason it out numerically to a result, but such reasoners should at first take care that the hypothesis is sound, which, to my view, this does not appear to be. At all events, there is no reliable evidence for it.

But passing from this point of the subject to that which to me seems far more important, viz., what Mr. Proctor terms

* Rev Dr. Haughton, F.T.C.D.

the decline and death of worlds, I would remark that such a doctrine does not appear to me to be warranted either by the analogy of our own globe or the observation of other planets—while it is contrary, so far as I can see, to the general analogy of nature; and so far as the final history of our own world is concerned, seems to be directly opposed to the testimony of Scripture concerning it. But for this last mentioned fact, indeed, I should not have thought of noticing this lecture, and what I cannot but consider the somewhat wild and unwarranted speculations contained in it in a scientific point of view; but when the tendency of scientific speculation is to extinguish or ignore the testimony of the Scriptures, I may be fairly permitted, as within my especial province, to demur to some of the statements and conclusions in it which appear to do so.

“In considering the earth’s future,” he says, “we may recognize in the moon’s actual condition a stage through which the earth will hereafter have to pass. When the earth’s inherent heat has passed away, and long ages have elapsed since she had been the abode of life, we may believe that her desert continents and frost-bound oceans will, in some degree, resemble the arid wastes the astronomer recognizes in the lunar surface. The earth may part as completely as the moon with her internal heat; the rotation of the earth may, in hundreds of millions of years, be slowed down by tidal action into agreement with the period in which the moon completes her monthly orbit, and every form of animal and vegetable life perish from off the face of the earth.”—“Our Place among Infinities,” page 29. It appears by this statement that there are two reasons assigned for bringing about this strange conclusion of our world’s history. First, the action of the earth’s tides, by which acting, in some measure, as a break upon her motion, her diurnal rotation will be shortened, and is affirmed to be actually shortening, continually lengthening our days

thereby—but so slightly as to be all but imperceptible; but, nevertheless, ultimately leading to the inevitable result of her rotation and revolution coinciding, as in the case of the moon.

The second reason assigned for our earth's melancholy future is her cooling down, or the gradual departure and final extinction of her natural heat and fires, and the consequent departure of her oceans and atmosphere by freezing. This being effected, the earth will remain a desert like the moon, and no inhabitants will be found here—and this theory Mr. Proctor applies not to our globe only, but to all planets and suns in the universe, which, he affirms, must go through the phases of planetary or solar infancy, manhood and old age, and final decrepitude and death, and the life they may have contained (animal or intellectual), however long to us, he affirms, to be really what Professor Tyndall calls it with reference to planetary life, "but a ripple on its surface."

Such speculations have a charm for some minds that are never satisfied with what is certain, but are ever pressing forward for something new, and startling, and sensational. But what are the grounds for assuming them as demonstrated? Granting, for argument's sake—and the delicacy and difficulty of instrumental experiments for ascertaining such minute movements must always be considered—but granting that the tides do at present shorten the diurnal period of our globe by an all but inappreciable fraction of time, does it follow, as a matter of certainty, that our revolution and rotation will synchronise in consequence, or be performed in the same period, as is the case of the moon. Can Mr. Proctor, or any other man, answer for this conclusion otherwise than hypothetically, *i.e.*, if our period of rotation continues to be shortened as it is? But who is to ensure this for a hundred or a thousand millions of years? La Place, looking as a materialist and mathematician at the machinery of our solar

system, assures us of its stability. He says :—“ The arrangements of the solar system are stable in the long run. The *orbits* and *motions* remain unchanged. Every planet in its orbit undergoes deviations on this side and on that of its average state ; but these deviations are never very great, and it finally recovers from them, so that the average is preserved.” “ These perturbations,” he says, “ are not indefinitely progressive ; they are periodical. They reach a maximum value, and then diminish. The periods which this restoration require are for the most part enormous—not less than thousands, and, in some instances, millions of years ; hence it is that some of these apparent derangements have been going on in the same direction since the beginning of the history of the world ; but the restoration in the sequel is as complete as the derangement, and in the meantime the disturbance never attains a sufficient amount seriously to alter the adaptation of the system.”* That which applies to the orbit of a planet round its primary may surely be applied to the analogous disturbance in its rotation, by whatever cause it is produced, with equal force and truth. It is premature, therefore (to say the least), to predict what is to happen some hundreds of millions of years hence to our planet in consequence of its present diminished rotation, which may cease or return as gradually to its normal state long before the period predicted.

So far viewing the solar system even as a mere piece of machinery, there does not appear to be any reliable evidence for such an astounding conclusion.

But *who*, except a materialist, would thus view the work of an intelligent Creator, who sits behind all and above all—controlling and governing every movement of every sun and planet as it pleases Him, *who* can assert the *perpetual* continuance of a check upon the rotation, which, in a moment, if

* “ *Système du monde.*”

it pleased Him, could be removed. To illustrate this, there is a passage in the Book of Revelation, xxi., 1, in which it is said, whether in a figurative or literal meaning—respecting the earth—it matters not, that the time shall come in our planet's history when "there shall be no more sea."

Now, without assuming that this is necessarily to be taken literally, which may or may not be the case, no one could affirm that the Creator could not cause such a change to take place in our planet. And yet if it *was* done, what would become of the tidal friction that is assumed as demonstrative of the diminished rotation of our planet and its final decline and death?

We may, therefore, safely dismiss this scientific speculation as insufficient to prove, to the minds of those who believe in an intelligent Creator, the conclusion of our earth's future, as affirmed by the Lecturer.

The second reason assigned is the cooling down of the earth by the departure of her internal heat and freezing of her oceans and atmosphere.

The question here also "is begged." Who can tell us the exact amount of heat the earth has lost since man became the tenant, or who can measure the effect already produced by that supposed loss, or who can prove that the earth ever will part with all her heat, or that if she did we should be in a worse condition than we are at present. Ages ago the earth presented (during her glacial period) a surface far greater than the present of solid ice, yet at that period, according to the theory of gradual cooling down, the earth must have been, comparatively speaking, in the fiery heat of its youth internally. How came such a surface upon it then? The fact is, we know but little what is the effect, if any, of the internal heat of the earth upon our temperature, and so long as we have the sun and our atmosphere, as at present, we have nothing to apprehend from the withdrawal of the internal fires of our globe.

So far, with regard to the scientific aspect of the earth's future (a picture of which is given to us by Mr. Proctor to contemplate in our desert-satellite), incorrect, as I conceive, in every point of view, both as respects the moon and ourselves, while, in its Scriptural aspect, the doctrine of the earth's future, as taught by the Lecturer, is, to my mind, wholly untenable.

CHAPTER II.

MR. PROCTOR, having thus endeavoured to establish the fact (as a mathematical certainty) that the earth after (say) a thousand million of years must die, and become an uninhabited globe for ever, gives us, as I have already mentioned, a picture of ourselves to contemplate in the present desert state of the moon. This, he says, is what the earth will one day come to. He urges that it is "a mistake to look upon the moon as a mere satellite of the earth, that she was rather a companion planet, and at one period capable of supporting life; and, having endeavoured to account for the numerous small craterlets visible on her surface by his favourite theory of the fall of meteors—of which, in my experience, there is not the slightest proof nor indication in their appearance—he states his belief that, at a former period, there were oceans in the moon that occupied the dark spaces now apparent there, but as the moon waxed old, both ocean and atmosphere disappeared, from the same causes that were at present in operation upon our own globe." But what grounds are these for assuming the present condition of the moon to be an analogous illustration of the imaginary death and ruin of our globe? In no respect is there any such resemblance or analogy between the two globes. On the contrary, close scrutiny of our satellite reveals a con-

dition wholly different, and leading to the conclusion that the moon never could have been a miniature earth, any more than that the earth will ever become a desert moon. The moon presents to us simply an object with a single view or purpose in it, viz. : that of being a satellite to the earth—and as such, performing the functions of one, and nothing else—being airless and oceanless. The apparent resemblance to some of the great tracts on the earth, comprised in lunar mountains and plains, arising, doubtless, from the same causes that gave birth to ours, viz. : her “contraction” from a state of molten heat to cold and solidity—common to all planetary bodies, and suggested by the strange, and wild, and rugged conformation of her surface ; especially by the chief feature of her desolate country, the existence of numberless crateriform objects, scattered broadcast over her, and indicating a cosmical and rudimentary condition, from which she has never departed, and never will. In truth, this is declared in the only record which we have (and that an inspired one) of her creation, and the purpose of it, viz. : As the “lesser light” (*i.e.*, smaller than the sun), to rule the “night” as the sun rules the “day,” her condition accordingly is conformed to this purpose, not the only one, it is true, but the chief one—and her satellite nature is as plainly suggested there, in the Scripture record, as our observation of her functions proves. But she never was intended for a planetary habitation, and it is evident her cosmical or rudimentary state is that which we now behold, not the wreck or decline of a planet once furnished with inhabitants, ocean, and atmosphere, but a rugged rock, whose gravity regulates our tides, and whose reflected light beautifully illumines and cheers our nights. Were it otherwise indeed, the moon would be wholly unfit to perform her present functions ; the presence of lunar water and atmosphere, would imply the presence of a constantly clouded surface, while oceans, if they had any, would be continually submerg-

ing her land, and under the influence of our powerful attraction, sweeping in devastating floods over her surface, rendering habitation impossible. The moon, therefore, is no illustration of the imaginary condition of our future, and utterly fails as an analogical picture of our world, when some hundred millions of years shall have passed away.

But this doctrine of the retrogradation of the earth is as contrary to the analogy of nature, as exemplified in the revelations of geology, which plainly exhibit progress and advance in the history of our planet towards perfection, beginning with the simplest and most rudimentary forms of life, up to the more complex—terminating in man, the most perfect of the vertebrates, and without the slightest indication of terrestrial decline in any other quarter, or going backwards to its former condition. The assertion, therefore, that there will be such a decline hereafter, is, to say the least, gratuitous and without proof; while it is contrary to the whole analogy of nature which we see before our eyes. But there is evidence of another kind against this doctrine of the earth's future, which gives an importance to the subject which it would not otherwise possess; for (humanly speaking), and merely as a matter of scientific conjecture, or even proof, it need trouble us very little whether, after a lapse of 100, or 1,000 million years, our earth decayed and died out (like a lamp whose oil was expended) or not, and, still less, whether (as Mr. Proctor, and those who agree with him, think), every sun and every planet in the infinite universe met the same fate in their turn, until (as he states), "but one single star (Sirius) should remain as the sole occupant of the desert universe, having, from its superior magnitude, taken the longest time to die;" it would matter little (I say) to us, personally, were it not for the testimony of revelation against it (at least so far as our own globe is concerned), and analogically with regard to the other heavenly bodies. True it

is that the Scriptures, though a revelation from God, were not given to men to set them right upon such questions as these. They had a higher and more important object than solving the problems of science—either in Astronomy or Geology. Nevertheless, as the question of man's inhabitation of the earth, both present and future, is necessarily mixed up with the permanence of his habitation, the Scriptures might naturally be expected to take notice of the question here discussed, and directly or indirectly assure us of the permanence or non-permanence of the planet we now inhabit, or are to inhabit in future. This we shall find has been done, and so clearly, that while from the beginning to the end of the Bible there is not a syllable to imply such an end to our globe, as is predicted by this school of philosophers—on the other hand, it distinctly declares, all that the analogy of nature teaches, viz.: that as our planet is a receptacle for life, and was so intended to be, neither the planet itself, nor the life that is upon it, shall ever cease; or “the latter exist and pass away like a ripple;” and that as the analogy of nature shows constant progress to perfection, so we may look for a perfect future for our globe, in which life and beauty will attain a climax which it never knew before, from which it never will depart, and a permanence to which the term “everlasting” can alone be applied with truth. That the earth was intended for a habitation for immortal beings is in itself, indeed, a security for its continuance and permanence. And this the Scriptures, as will be seen, plainly assure us of. But before quoting their testimony upon this subject, it may be well here to remark that the usual objection to receive their evidence in determining such questions can no longer be admitted with reason or consistency. Two of the most eminent modern physicists* having recently declared and logically proved that “the presumed incompatibility of

* Messrs. Stewart and Tate.

science and religion does not exist," and "ought to be self-evident to all that believe that the Creator of the universe is Himself the Author of Revelation," and that the truth is—"that science and religion neither are nor can be two fields of knowledge, with no possible communication between them, such an hypothesis it is shown by them is simply absurd."* Let any person, then, who objects to the introduction of the Scriptures as an evidence in determining this or any other such question upon which they may speak clearly, carefully study the work of these two able writers, and reply to them if they can ; if not, let them receive without prejudice their testimony.

That the earth was intended for a habitation, Isaiah tells us in his 45th chapter, as follows:—"Thus saith the Lord that created the Heavens—God himself that formed the Earth and made it—He hath established it; He created it not in vain—He formed it to be inhabited." In this passage the great purpose for which the earth, and all the planetary bodies, were made is declared, viz.: to be inhabited; their formation, in fact (it is implied), would be in vain without it—as vain as the building of a house on the earth would be if the architect or builder intended it should never be inhabited—built it, in fact, in order that it might become a ruin. He would rightly be set down as a fool who built a house with such an intention. True, earthly buildings fall into ruin, but not with the intention or wish of the builders. We have no evidence, however, that planetary houses, as we may term them—"the many mansions of our Father"—will ever become ruins; indeed, the intention assigned for forming them, proves the improbability of such a conclusion to our planet. Hence, when man was first placed here, the promise or covenant was made with our race, of which the rainbow was to be a witness, of a perpetual tenancy and a perpetual maintenance of the present laws that govern our planetary habita-

* "The Unseen Universe" (Preface).

tion : thus (Gen. viii. 28), it is said by the Creator Himself—
 “ While the earth remaineth, seed-time and harvest, cold and heat, and summer and winter, and day and night, shall not cease.” Here the revolution and present rotation of the earth, or our annual and diurnal motions, by which our seasons, day and night, are produced, are guaranteed to us, “ so long as the earth remaineth ;” in other words, for ever—for where is the conclusion to be drawn from this passage, that the earth shall be ever annihilated or remain, and yet be destitute of seasons, days, and years, and alternate heat and cold (all these having ceased), and this, although the same sun is still to shine in the heavens (in vain) for the purpose of carrying out the scientific theory of this school of philosophy, which tells us the earth *must* suffer decrepitude and death.

CHAPTER III.

THERE are two passages in Scripture which at first sight may seem to countenance the doctrine of the earth’s total destruction, and are accordingly quoted by those who favour the teaching of this school of physicists, who, whether they themselves are believers in the Scriptures or not, are glad to find an argument from them to convict their opponents. The first of these passages is from Psalm cii. 26, quoted afterwards by St. Paul in the first chapter of the epistle to the Hebrews—it is there said, “Thou, Lord, in the beginning hast laid the foundations of the earth, and the Heavens are the work of Thine hands. They shall perish, but Thou remainest, and they shall wax old as doth a garment, and as a vesture shalt Thou fold them up ; and they shall be changed, but Thou art the same, and Thy years shall not fail.” It is evident that this sublime and somewhat figurative passage

gives no countenance to the doctrine of the earth's destruction or final decline and death, or that of other planets and suns in the Heavens. It is simply a comparison between the mutability of all created things, such as the Earth and its Heavens, and the immutability and unchangeableness of God their Creator. The former are perishable, not that they are to languish and finally perish, for it is expressly said that they are only to be changed, but being subject to change or even to destruction if their Creator pleases, they form a strong contrast to the unchangeable and indestructible nature of the Almighty. There does not appear to be in this passage any reference to other planetary worlds, only to the Earth and its own Heavens, the latter being the same word as is used in Genesis i. 1, "God created the Heavens and the Earth." Thus—the Earth and its present Heavens (or atmosphere) will be changed, in what manner precisely we are not informed, only that they are called by Isaiah and Peter—the new Heavens and the new Earth; but there is not a word to express their annihilation or destruction, the word *perish* not necessarily bearing such a meaning, and being explained by the word *changed*; that our world will go through such a change, as it has gone through many already, there is no doubt, but *that* will be its last change, and a change for the better—a condition that will know no change for evermore—a change from an imperfect to a perfect condition.

No argument, therefore, can fairly be derived from this passage, for the final decrepitude of our planet, much less of other planets and heavenly bodies, out and beyond us, of which we *know utterly* nothing.

The other passage quoted to support the doctrine is from 2nd Peter iii. 10, who says—"The heavens shall pass away with a great noise, and the elements shall melt with fervent heat; the earth, also, with the works that are therein, shall be burnt up," &c.

This description, at all events, does not answer to the gradual decline of our globe—by the slowing of her rotation—but is a sudden catastrophe, which might, at first sight, be imagined to be the final destruction of our world. The next sentence, however, clears up that matter—it is not our destruction, but only a change, as described in the former passage. “Nevertheless,” says Peter, “we, according to his promise look for a new Heaven and a new Earth, wherein dwelleth righteousness, *i.e.*, a renewed Earth and Heavens.” Meaning, probably, a conflagration partial as was the flood—and certainly not annihilation—but preparation for a change—a change for the better. It is said (Isaiah lxxv. 19)—“I will rejoice in Jerusalem and joy in my people, and the voice of weeping shall be no more heard in her, nor the voice of crying.” So again in the magnificent description of the judgment of the kings of the earth *on* the earth, by the same prophet, in his xxiv. chap., v. 19–22. It is added in the 23rd verse—“And the moon shall be confounded, and the sun ashamed when the Lord shall reign in Mount Zion and in Jerusalem, and before his ancients, gloriously.” This, be it observed, is said of Him, of whose kingdom it is said by the Angel Gabriel, “there shall be no end,” that the Lord God shall give Him the throne of his Father David, and He shall reign over the House of Jacob—*for ever*. And this is the place (Jerusalem) of which it is said, Rev. xxi. 24—“The nations of them that are saved shall walk in the light of it, and the kings of the earth do bring their glory and honour into it, and they shall bring the glory and honour of the nations into it, and his servants shall serve him, and they shall reign *for ever and ever*.” Now, the entire scene and place described here both by Isaiah and John, are plainly the “renewed earth” after the final conflagration and judgment. After this, the permanence of the new heaven and the new earth, is assured to us, not by one passage of Scripture, but

by many. Thus Psalm cxix. 9—"The earth abideth for ever;" Isaiah lxvi. 22—"For as the new heavens and the new earth which I will make shall remain before me, saith the Lord; so shall your seed and your name remain." That the new earth is the present globe, only renewed and beautified, is stated in the 65th chapter of the same prophet, verses 17-19—"For behold I create new heavens and a new earth, but be ye glad and rejoice *for ever* in that which I create. For behold I create Jerusalem a rejoicing and her people a joy." That Jerusalem here is a *place* and not the *Church*, is evident, as it is distinguished from the people that are to inhabit it. In fact, the very spot upon this globe where Jerusalem now stands, a spot so remarkable in the annals of terrestrial history, that it accords with the high probability of reason as well as Scripture, that although the earth may undergo important changes by flood or fire, it will never be annihilated, nor sink into the decrepitude of an uninhabited desert—a forsaken world. "The earth," says one of the ablest of our commentators, "as one of the worlds of God, has occupied too important a position in the history of the universe to make it to be easily believed that the place where the Son of God became incarnate and died should be utterly swept away;" or we may add (according to Dr. Haughton),* "converted into an Inferno," but, on the contrary, that a world once so beautiful when it came from the hands of its Maker, should be restored to primitive loveliness, and that a world which seems to have been made primarily (1st Peter i. 12) with a view to illustrate the glory of God in redemption, should be preserved in some appropriate form, to be the theatre of the exhibition of the development of that plan through eternity.—Barnes on 2nd Peter iii. 13.

Assuming, then, that the earth is intended for, and will be, the permanent home of the Christian hereafter—upon which the same sun will continue to pour its rays by day, and

* Lectures on Physical Geography, 1876.

from which the moon will not withdraw her light, implying the perpetual continuance of all those beautiful contrivances, and arrangements, and effects connected with our orbit round our primary, and our own rotation on our axis, with which we are familiar now, then, the doctrine set forth by the learned Lecturer—that the earth would fall into final decrepitude and become unfit for a habitation—is the very opposite of the teachings of that Book which we, as Christians, believe and stake our hopes of future existence upon, as well as contrary to the analogy of nature, and the probability of events. But, it may be said, if the earth is destined to be the eternal habitation of mankind after the final judgment, what of the heaven of heavens? To this it may be replied—Heaven is the present abode of the blest until all that is prophesied is accomplished, and the earth is prepared for them, an everlasting habitation, with life and beauty for evermore, and by whatever means it is accomplished, it is plain that our Lord will not suffer the place He has prepared for His people to fall into the wrinkles of old age and decrepitude, and become a lifeless, uninhabited desert. A word more in reference to the arguments for the gradual decline and death of other worlds or their suns, derived from observation by the telescope or the spectroscope, upon which much stress is laid by Mr. Proctor in other papers of his upon the subject. It is evident that all here must be founded on mere conjecture. The sudden flaring up of some known stars, or the apparent paling and decrease of magnitude and light in others. The sudden appearance of stars unseen before, or supposed never to have appeared to mortal sight previously, such as that seen by Tycho Brahe in 1574, or that seen in Corona a few years ago. All these phenomena, and many others brought to light by the spectroscope, as to the constitution and components of stars, may be easily explained without the necessity for believing in sudden catastrophes

befalling them, involving their partial or entire destruction, together with that of the systems belonging to them (invisible to us). These phenomena, with which all astronomers are familiar, furnish no argument for the destruction or extinction finally of any *one*, much less of every sun and system in the universe, but must, in fact, be mere guess-work. As to the occurrence of any mischance in the Heavens, it is as improbable, as it is unwarranted, by any proof we possess, derived from observation of these awfully-distant bodies and their mysterious movements or changes. So long as any reasonable and more probable explanation of such sights in the Heavens can be afforded, there should be no positive assumption of certainty in reference to what is taking place out there amongst objects so remote, with a view to establishing a system of materialism, in which chance is made the ruler and governor of each star, and not an omnipotent and all-wise God, who, we are told, "numbereth the stars, and calleth them all by their names." Yet, the self-complacency with which some anonymous reviewers of astronomical works and Lecturers in the present day, lay down the law upon this subject, and the contempt with which they treat any endeavour to show the greater probability of ORDER existing in the heavens, as well as in the earth, would be amusing if it were not injurious. Collisions of planets and conflagrations or extinction of suns, and the consequent destruction of their attendant worlds, are spoken of as matters of common occurrence and experience by these writers. Chance alone preserving them from destruction, like a fleet of ships without a helm or pilot. The improbability of such a theory speaks for itself, and requires no comment from me. Let one of the greatest of poets describe such teaching :—

" And if each system in gradation roll,
Alike essential to th' amazing whole;
The least confusion, but in *one*, not *all*
That system only, but the *whole* must fall.

Let Earth unbalanced from her orbit fly—
 Planets and stars run lawless thro' the sky ;
 Let ruling Angels from their sphere be hurled,
 Being on Being wrecked, and world on world.
 Heaven's whole foundations to their centre nod,
 And Nature trembles to the Throne of God.
 All this dread order break—for whom ? for thee ?
 Vile worm ! O madness ! pride ! impiety ! ”—

POPE'S "ESSAY ON MAN."

In reference to the observation of certain remarkable changes occurring among the stars, as an evidence of such a doctrine, we may remark, that there are three principle phenomena that have been observed :—1st. New stars, never before seen, have appeared suddenly, such as that which was seen by Tycho Brahe in 1574. 2nd. Old stars, well known, have disappeared from their place and not returned. 3rd. Some have suddenly blazed up to great brilliancy and size, hitherto known as small and faint objects, becoming for a time stars of first from having been only of sixth magnitude, and then decreased in magnitude again, returning to their previous condition. Some, during these changes in magnitude, have likewise changed in colour, as in Tycho Brahe's star, which was first white and then became red, and then paled away until it disappeared after sixteen months. In the constellation of Corona or the Northern Crown, a few years ago a star, never before seen, appeared suddenly, blazed out fiercely, and afterwards underwent inexplicable changes of colour before it disappeared altogether. However interesting and curious such sights are to astronomers, they do not, as I conceive, furnish any argument for the destruction or dying out of stars or systems, neither telescope nor spectroscope being sufficient to bring us any certain intelligence from these distant regions that is not quite consistent with another explanation. This class are known as variable stars, the various changes they undergo, their appearance or disappearance may be explained by the vastness and eccen-

tricity of their orbits, which would cause them to disappear *for*, or re-appear *after*, intervals of thousands of ages, or in short periods from hundreds of years to one or more, or, as is the case with some, to the short period of a few months—those, it is manifest, with the long periods would be either absent during man's tenancy of earth, or appear to us for the first time, but never again; or stars, well known for centuries, disappearing from our view for ever, and gradually losing their magnitude and splendour as they recede. With regard to those that undergo the changes referred to, such as flaring up to great brilliancy and dying out again, this may be accounted for by changes in their condition, such as have been observed in our own sun, which has had frequent vast outbursts of hydrogen, one extending 350,000 miles, seen a few years ago, but returning to its normal condition again, and by no means implying the necessity for the destruction of the systems belonging to them, which, in a recent paper by Mr. Proctor (on suns), is said to be a possible (though not a probable) catastrophe belonging to our own system. Of this, or of such matters befalling other suns and systems, there is no proof whatever, and no probability. Behind all, we should remember, sits One who has arranged and balanced every star, and every power connected with it, with such a perfect and beautiful accuracy of adjustment, as can be seen in our own system, that there is not the slightest error or flaw, to a hair's breadth, to be discerned in it. So far, therefore, as the analogy of our own solar system is concerned, there does not appear to be a vestige of probability for the death of worlds, or the extinguishing or burning out of suns, and we may safely leave the anticipations and predictions of such astronomical prophets to the region of wild conjecture.

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